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ABSTRACT

The changing face of the workplace and composition of the work force have necessitated new approaches to workplace safety that focus on motivating trainees to learn and practice safe workplace behaviors. Unfortunately, most knowledge regarding work motivation is theoretical and not directly usable by safety training professionals. The notions of intrinsic and extrinsic motivation can help safety training professionals understand industrial/corporate problems such as the decline in the work ethic and can help them prepare workers for future workplaces, which are anticipated to include more teamwork and less supervision. Research on intrinsic motivation has established the effectiveness of using goals, incentives, and feedback as reinforcers of intrinsic motivation. Research has also shown that intrinsic motivation is increased through both physiological and psychological design/redesign of jobs to include motivators. Among the various intrinsic characteristics attributed to the job that have been developed and that should be considered when safety training is an issue are the following: achievement, activity, authority, creativity, importance, independence, interest, knowledge of results, personal growth and development, promotion opportunity, recognition, responsibility, service to others, utilization, and variety. (Contains 11 references.) (MN)

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ED 378 353

Why Motivation is Important in Safety Training

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Introduction

The changing face of the workplace and the composition of the workforce are making new approaches to teaching safe work behaviors on-the-job a necessity. Changing demographics of the workforce, global competition, and the evolution from a manufacturing to a service economy require new approaches to job-related safety training and behavioral safety problems.

Traditional worker involvement and participation, training and education programs, and enforcement of existing safety policies alone will not assure safe work behaviors in the "new" workplace. Principles of human behavior that make "psychological sense" are being used for the first time in many safety training programs.

Psychological theories and applied research in work motivation have shown that safety problems associated with behaviors are affected by worker's motivation. Work motivation can be described as both intrinsic (internal) and extrinsic (external) [See inset for definitions]. Intrinsic motivation is a major factor in explaining much of the work behavior of many workers-- especially team workers and workers involved with technology.

Todays' more knowledgeable, educated, and "worldly" worker requires more intrinsic motivation than workers in the previous industrial era. This does not mean that extrinsic rewards such as money, benefits, bonuses, etc., are not important (we all know better, don't we?), it simply means that as we become more responsible for increasingly complex jobs we will require higher levels of intrinsic motivation to keep us satisfied.

In order to change work behaviors in the new workforce, training and safety-training professionals must understand what makes people act as they do and become skilled in the application of work motivation theories that they decide work for them. Further, they must critically question how motivation theories and the results of applied research in work motivation can be used to help them design training programs and other interventions that will result in positive behavior changes on-the-job. The bottom line is that training and safety training professionals should be more concerned with the extent that motivation affects behavioral problems related to safety. This article is an attempt to provide a starting point in achieving this objective.

Assumptions concerning motivation

Motivation is an invisible and hypothetical concept. It can't be measured directly, but only through theoretical evidence and, some people believe, through behaviors. Six assumptions concerning theoretical concepts of motivation should be considered before proceeding.

The **first** assumption is that internal, hypothetical constructs (a construct is a trait that you can't directly observe, like intelligence) such as needs, beliefs, attitudes, and perceptions have an influence on work behaviors. Herzberg's well known "two-factor" theory (Herzberg, Mausner, and Snyderman, 1959), form a theoretical basis for research in work motivation and specifically intrinsic motivation (see inset for a description of the two-factor theory of motivation).

Next, a distinction between work motivation and performance should be made. Job performance can be defined as the accomplishment of work goals, regardless of the means of their accomplishment. Work motivation is an important factor in job performance but a causal relationship (one causing the other) can't be assumed nor implied. Generally speaking, poor job performance results from more than low motivation.

Third, motivation generally causes and sustains a worker's behavior. Desired behaviors can be modified through a system of reinforcers and rewards. Rewards can originate both within or internal to the person, as well as beyond an individual's being. Many believe that intrinsic motivation and the intrinsic rewards required to satisfy it, such as recognition and job challenge, will become more important in the changing workplace (Boyett & Conn, 1991).

The **fourth** assumption is that behavior is *instrumental* in achieving some valued reward. People value different rewards; what is reinforcing for one person is not necessarily so for another. Both intrinsic and extrinsic rewards reinforce behaviors. What is interesting to note here, however, is that intrinsic motivation can be influenced, both positively and negatively, by extrinsic rewards. For example, if a person is intrinsically motivated by a particular task and is all of a sudden given a material reward such as a promotion then the positive affect of the intrinsic reward may be reduced.

Fifth, unsafe work behaviors can be attributed to a lack of internal motivation. Safety-related work behaviors can be affected and improved through an understanding and application of intrinsic motivators and rewards.

The **sixth** and final assumption is that the ideas and theories of intrinsic

motivation that have been applied to safety and accident research [such as Gordon's Epidemiology of Accidents and Haddon's Contributing and Countermeasures Matrices (Haddon, Suchman and Klein, 1964)], can and should be applied to the design and development of safety- related training and development programs.

Theories important to motivation

The work motivation theories of Herzberg, the expectancy theories of Lawler, et al (1967, 1970), and McClelland's (1961, 1962) achievement motivation research represent the primary *cognitive* (based on hypothetical and unobservable thought processes) foundations on which much intrinsic motivation theory rests. Safety-related work motivation theories have traditionally endorsed a more *behavioristic* (based on observable stimulus and response) approach. That is, they are based on the stimulus-response level of behavior popularized by B.F. Skinner (see reference list) emphasizing that all behavior could be linked to positive and negative reinforcement schedules. Both approaches proposed that reinforcement be linked with desirable behavior, and both emphasize the importance of the context or the environment in which the behavior happens.

The several well known theories specific to intrinsic motivation include: the incongruity theories of Lawler which rely on cognitive (thought) principles and Deci's competence theories that emphasize a need fulfillment model (that we are motivated based on our fulfilling some need) of behavior. Deci states that in order for people to be motivated they need to feel mastery, competence, and self determination. McClelland carried this a bit further by saying that workers can be trained to respond to many challenges because of their need for achievement, and we can define these challenges as being safety-related.

Heckhausen classified six concepts of intrinsic motivation which can be applied to safety-related training design and implementation:

1. Relates to drives or motives.
2. Refers to all activities including those having no set goal such as play.
3. Concerns behaviors that aim at achieving the maintenance or reinstallment of an optimal operation level- no concern for behaviors that decrease or negatively affect working at ideal performance levels.
4. It is a feeling of personal causation- in other words, to be in charge of our own lives.

5. It is the pure enjoyment in an action- a "just do it" mentality.
6. Refers to a common denominator between behavior and the goal you are motivated to achieve.

Deci's works are generally considered the most respected of the intrinsic motivation theories and serve as the basis for the general assumption that intrinsic motivation does exist and, in fact, has an affect upon workers in a job environment (see references for Deci's major works). Additionally, Deci suggested that intrinsic motivation can be affected by extrinsic rewards such as pay. Experiments with combinations of intrinsic and extrinsic motivation show that intrinsic and extrinsic incentives may not be additive. That is, some extrinsic rewards have been shown to actually reduce intrinsic motivation.

An understanding of the theoretical foundations of intrinsic motivation- while grounded in hypothetical constructs such as intelligence, attitudes, and perceptions- can be applied in the analysis and development of safety training and other interventions designed to improve safe work behaviors on-the-job.

Applying theory to practice

Application of intrinsic motivation theories to actual work settings has met with varying success. Limited research in reinforcement through recognition and job re-design and job enrichment have provided some insights into the application of intrinsic motivation.

The behavior modification approach popular in many safety programs is based in part on Edward Thorndike's *law of effect*, which generally states that behavior that has rewarding consequences is likely to be repeated while negative consequences tend not to be repeated- similar to Skinner's behaviorism theories.

In reviewing theories important to our discussion of motivation and safety behaviors on-the-job it should be noted that *behaviorist theory* assumes that behavior is determined by reinforcement history and is contingent upon the environment. Reinforcement can be either positive, like a monetary reward or negative like a demotion. According to behaviorists theory, people have no free will nor personal choices in their behaviors. Internal constructs such as attitudes and motivation do not really exist and are rejected in favor of external stimuli and consequences of behaviors based solely on external stimuli (stimuli is basically anything that produces a response or arousal in us).

Cognitive theorists such as Lawler, on the other hand, emphasize thought as a

causal factor in behavior, that is people can and do control their behaviors through cognitive (thought) choice, and choices are based on goals and behaviors that result in achieving them. Behaviors can then be attributed to internal beliefs, attitudes and motivations. Unlike behaviorists, the cognitive theorists believe that people have choice, but those choices are determined by your beliefs, attitudes, and motivations. Both theories assume to varying degrees that people are *hedonistic*, pleasure-seekers minimizing pain while maximizing their survival potential. What this means is that we will usually seek a "path of least resistance" when given a choice between something that is easy to do or painful versus something difficult or painless. Behavior modification on-the-job can be analyzed, developed, and initiated by safety training professionals through a synthesis of these two broad work motivation theories. For example, lets say that a team of workers is rotated to the second shift in a shift environment and all of a sudden begin to show trends in safety problems. The safety training specialist can use his or her knowledge of behavioral and cognitive theories of motivation to make decisions concerning the root causes of the problems instead of simply reacting to observable actions, consequences, or behaviors.

The need for intrinsic motivation

In the past, extrinsic motivation and reward has been used to reinforce positive behavior change. Behavior modification on-the-job was generally limited to such external rewards such as pay, plaques, banquets, and trinkets like cheap wrist-watches (we are not talking Rolex here). Few intrinsic rewards such as recognition, job enrichment (adding what Herzberg called *motivators* to the job) or increased job responsibilities were recognized as being reinforcers, and certainly were not used as overt or obvious rewards. The current increase in people empowerment, involvement, personal responsibilities, and the tremendous emphasis on quality and teamwork requires a change in how workers are rewarded, how reinforcement is maintained, how unsafe behaviors may be modified, and the role training plays in this whole behavior modification process. We should probably stop here and make a quick but important point that behavior modification on-the-job is a worthwhile and ethical process only if workers (this includes all of us) are aware of the modification. Coercion and secrecy should never be a part of the learning process.

Intrinsic motivation is an important tool in achieving behavioral change on-the-job. Behavioral safety problems such as worker attitudes, stress, peer pressures, and

other unsafe personal acts can be addressed using intrinsic rewards and by relying on and applying the idea of intrinsic motivation.

A model of intrinsic motivation is presented graphically in Figure 1. This approach is based upon the work of Porter and Lawler (1968), and Pinder (1984), and offers a pragmatic (realistic) view of intrinsic and extrinsic motivators as used by workers on-the-job.

An examination of the relationships represented in the model can help explain the process of how intrinsic and extrinsic motivation reinforce both positive and negative work behaviors. Work behaviors and motivators that lead to accidents can then be further analyzed through application of a model that emphasizes *contributing factors* and *countermeasures* as (notions developed by Haddon and others) understood and used by safety professionals for many years. Lets take a closer look at the model.

Unsafe personal acts are types of behavioral problems that, generally speaking, lead to injuries, illnesses or even death. They include, but are not limited to, working unsafely, removing safety devices, using equipment unsafely, and horseplay. The model depicted in Figure 1 can be applied to a behavioral safety problem such as the unauthorized removal of a safety device.

Insert Figure 1 about here

For example, the performance or behavior of a worker removing the guard from a press brake in a work environment offering piece-rate compensation or pay for performance offers the worker extrinsic rewards and motivation in the form of money or recognition generally based on quantity (and sometimes quality) produced. The worker perceives the extrinsic reward (money) as still equitable (makes sense to them) and attainable even through an unsafe act and is satisfied as long as nothing bad (no accident or injury) happens to them.

The decision on reward probability, identified as p in the model, is based upon the strength of our operator's extrinsic motivation, his or her perceived equitable rewards, and their satisfaction. An accident attributable to a removed guard may (and probably would) cause worker dissatisfaction. If the dissatisfaction (in this case an accident or injury) is perceived as less powerful than the extrinsic motivator (money or other tangible rewards) then a decision to continue the unsafe behavior may be made by the worker and intrinsic motivation may be stopped. So, extrinsic reward or motivators do tend to

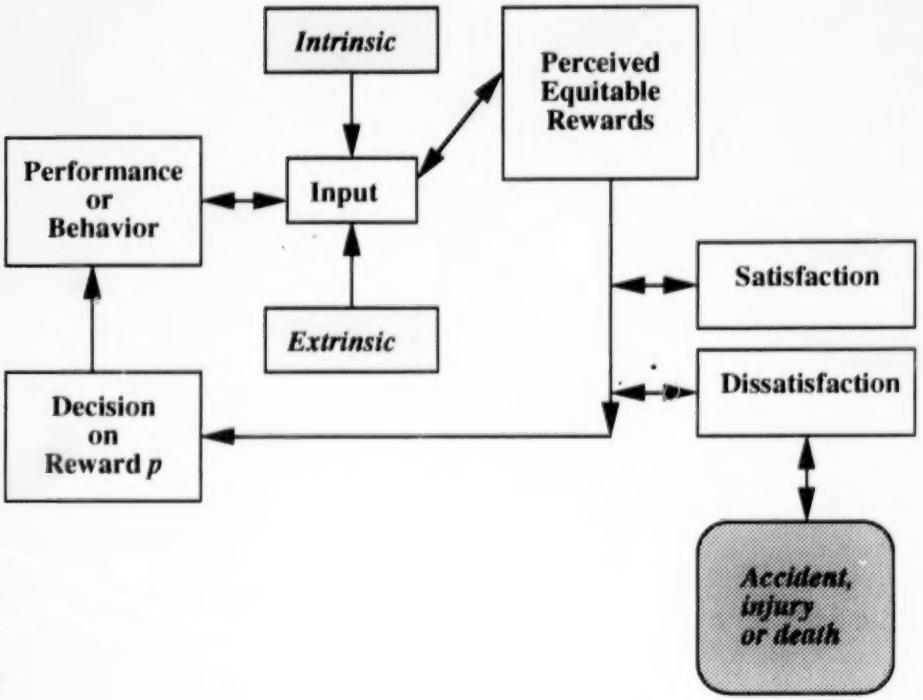

Figure 1 -
Intrinsic motivation model

Based on Porter & Lawler (1968) and Pinder (1984).

influence intrinsic motivation. Powerful stuff for the training professional to know when faced with a performance problem on-the-job.

Contributing factors to our press brake example can be identified as both *host* (the person involved in the accident) and *environmentally related* (the physical, psychological, and organizational environment surrounding the accident scene). Host contributing factors include affective influences such as attitudes, feelings, beliefs, and the emotional state of the worker. During and after the event host factors may include reactions to the event and decisions concerning future actions. Intrinsic and extrinsic reward structures on-the-job and the amount of dissatisfaction received are typical environmental contributing factors. Environmental factors such as job enlargement, satisfaction for a job well done, team building activities, and job enrichment can also be used to improve intrinsic motivation.

The training and/or safety training professional should have a good understanding of the worker's attitudes and past performance before implementing any motivational training program designed to enhance intrinsic motivation. Workers are individuals, are motivated by different things, and respond to external motivation differently.

The press brake is the *agent* in our example of the application of intrinsic motivation. Other agent contributing factors include how easy the equipment is to modify, the ability to operate equipment with the guard removed, prior attitudes toward the job, being unable to stop equipment in time to eliminate the accident, and difficulty in removing an injured worker from the equipment.

Countermeasures, defined as solutions or activities that would influence the outcomes of an accident consists of (a) removing the focus on the *product* of performance, that is, the extrinsic reward, and (b) replacing with a focus on the *process* of performance, or the intrinsic reward or motivation.

In the above example, a change in environmental focus from quantity to quality as in the case of starting Total Quality Management (TQM) or other quality improvement process may tend to remove the extrinsic motivators and support more intrinsic motivators. However, removal of extrinsic motivators may or may not tend to reinforce intrinsic motivation. And we already know that making extrinsic rewards reliant on performance may, in fact, reduce intrinsic motivation. Sometimes the introduction of a *contingent reinforcer* such as money may actually decrease intrinsic motivation and the performance or action attached to it. Again, this knowledge is powerful stuff for the training professionals when an organization is trying to implement quality improvement,

TQM, or even a continuous learning kind of process.

Sometimes an external reward causes a person to believe that they have lost control over the situation and have become no more than a "pawn" to the reward. Some people think that extrinsic rewards influence a worker's concept of why he or she is working and therefore leads them to believe that they are working just for the reward. This can possibly have a negative affect on a worker's primary attitudes toward work and even their work ethic. On the other hand, intrinsically motivated behaviors may actually be reinforced by extrinsic rewards such as money.

To further confuse the motivation issue, some behaviorists have suggested that behavior that persists in the absence of extrinsic motivation or stimuli may be maintained by yet another response-produced sensory stimuli with reinforcing properties. In other words, a simple stimulus/response action tends to reinforce the intrinsic motivation when extrinsic rewards are removed.

Intrinsic motivation as a training tool

The training and safety training professional should maintain a flexible and application-oriented attitude towards these somewhat opposing (and somewhat complex) theories on motivation. The usefulness of theories of intrinsic motivation can best be understood by applying them and by experimenting with different ways of increasing intrinsic motivation in a real work environment. Several approaches to increasing intrinsic motivation through countermeasures should be considered.

For example, using behavior-oriented theories, *goals and incentives* can be developed as *reinforcement* for intrinsic motivation. Incentives are effective for influencing behavior only to the extent that they influence the goals that people strive to achieve. Today through workplace efforts such as pay-for-performance schemes and the increased use of self-managed work teams the ability of workers to establish their own work goals and objectives are likely to cause them to be more personally involved in work and probably more intrinsically motivated. On the other hand, goal-setting through efforts such as teamwork may be seen by some as unfair and even unethical. Some workers may feel coerced into participating in goal setting when they have no internal desire to do so, which obviously affects their intrinsic motivation. Once again, powerful stuff to know when implementing teams and team building processes.

Next, the more formal *operant-behavior modification* theories of B.F. Skinner can be used to help define the *feedback* approach to increasing intrinsic motivation. Feedback

is useful in reinforcing overt behaviors as well as intrinsic rewards, although experimental research is not readily available to fully support this theory. Feedback can also be used to develop *modeling and shaping* approaches to intrinsic motivation. For example, typical of on-the-job training, modeling is imitating another employees' behaviors. Shaping is the building of desired behaviors over time as a result of the influence and/or instruction of a mentor (a journeyman in trade apprenticeships), teacher, or other worker, like teaching something one step at a time. The primary rationale here is that the imitated behavior already exists to some degree in the learner and is cued or prompted by the external behavior of another worker. Reinforcement of behaviors may then be considered as a *countermeasure*.

Intrinsic motivation is increased through both physiological and psychological *job design and re-design*. Safety can be improved when employers realize that jobs are not unchangeable. One assumption (and an incorrect one at that) is that people are easier to change than the job. The other assumption is that jobs are flexible and should be defined or re-defined to fit the needs of the worker (usually the correct assumption for the training professional).

It is more rewarding (and usually cheaper) for the worker to alter jobs than for the organization to attempt to alter the worker through training, selection, or coercive tactics. Some people are less malleable than jobs (especially trainers?). The workers of the twentieth and twenty-first century require more intrinsic motivation in order to be productive and be able to cope with the crazy pace of change on the job. They are more sophisticated, knowledgeable, "worldly" and usually better educated, resulting in greater demands for personal growth need satisfaction from their job.

Jobs are sources of arousal for people. Properties of any stimulus object or environment (such as a job) tend to generate varying levels of activation and arousal. The level of arousal is the key ingredient in job design and re-design. Slight deviations in one's optimal job stimulation may be satisfying and cause positive and productive behaviors. On the other hand, extreme deviations may cause negative extrinsic motivation, and result in negative and even deviant behaviors. These behaviors may result in unsafe acts such as day-dreaming, loafing, horseplay, and job detachment (not caring any more).

Jobs should contain *motivators*. Herzberg's theory (mentioned earlier), for example, argues that jobs must have certain characteristics (he called motivators) in order for them to provide adequate arousal and to satisfy our personal growth needs. A person

on-the-job, then, will experience internal motivation when a job generates experiences of meaning, responsibility, and knowledge or feedback of the results of his or her efforts.

Job enrichment, one aspect of job design, is defined as work activities from a vertical slice of the organizational unit combined in one job enabling workers greater job autonomy. Intrinsic motivation is influenced by individual differences between people in their attitudes and reactions to job enrichment. Job enrichment and other job redesign elements such as job enlargement (increasing the scope of the job) seek to increase and sustain worker's intrinsic motivation. The assumption is that higher levels of intrinsic motivation will enhance job performance and job satisfaction, as well as reduce the negative impact of absenteeism and turnover. Job enrichment is probably more useful for enhancing worker's attitudes than it is for improving performance and it may not have the same appeal for every worker. For example, new hires are primarily oriented toward establishing social interaction (socialization), while established workers are more interested, generally speaking, in extrinsic motivators such as pay and job security.

In addition to the factors listed above, a variety of other intrinsic characteristics attributed to the job have been developed and should be considered when safety training is an issue. They include: (a) achievement - a feeling of accomplishment, (b) activity - opportunity to stay busy, (c) authority - influence over others, (d) creativity - the chance to apply initiative and innovation to the job, (e) importance - work is valuable and important, (f) independence - autonomy, (g) interest - preferred work, (h) knowledge of results - seeing the results of one's effort, (i) personal growth and development - self fulfillment, (j) promotion opportunity - rewards for good work, (k) recognition - of work performed, (l) responsibility - for all aspects of the job, actions, decisions, etc., (m) service to others - improving the well being of people and organizations, (n) utilization - using best skills and abilities, (o) variety - opportunity to work with variety of assignments, people, and tasks.

Summary

The many theories of human work motivation provide a diverse background in which to base intrinsic and extrinsic motivation notions applicable to training and safety training professionals. According to many training practitioners, virtually all knowledge of work motivation consists of theory- not really useful to those "in the trenches". These theories have been more or less grounded in the observations of organizational/industrial

scientists and, to a lesser extent, practitioners in the field. These observations and what little empirical evidence there is should temper the degree to which training professionals attempt to apply the concepts of intrinsic and extrinsic motivation on-the-job.

The notion of intrinsic and extrinsic motivation can be useful in understanding such ambiguous industrial and corporate problems as the decline in the work ethic. The awareness that the need for intrinsic values increases as ones' extrinsic rewards are met is crucial in solving work-related motivational problems. Additionally, the anticipated changes in the workplace- such as more teamwork and less supervision - will require less external reward structures for workers and more internal rewards to fulfil the goals of continuous improvement, total quality management, lifelong learning, learning organizations, and decentralized, "lean" production.

To improve safe work behaviors and to assure that adequate countermeasures are applied to safety problems and accidents, safety and training professionals should assume that the most effective means of explaining and even predicting work-related, safe behaviors must rely on what is going on inside the worker- his or her internal states- and appreciate the power of intrinsic motivation.

Inset: Definitions

Extrinsic motivation. Rewards or motivation obtained by someone other than oneself- external to the individual. Extrinsic outcomes include money, prizes, promotion, and other tangible items.

Intrinsic motivation. Rewards or motivation from within oneself. Behaviors as a result of intrinsic motivation are performed for their own sake, not for material rewards such as money or goods. Behavior that is its own incentive.

Inset: Herzberg's Two-factor Theory

We have two basic sets of needs that either satisfy or dissatisfy us, and different parts of the job can serve to meet these needs. The first set of needs called *hygiene* factors tend to be dissatisfying and include needs for basic survival and maintenance. Hygiene factors are primarily extrinsic and not job specific- they include policies, salary, and relations with supervision or management. The second set of needs Herzberg called *motivators* or growth factors and are characterized by achievement , recognition, advancement, and "being all that you can be". Motivators are intrinsic to the content of the job and include things like recognition, achievement, and the job itself.

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